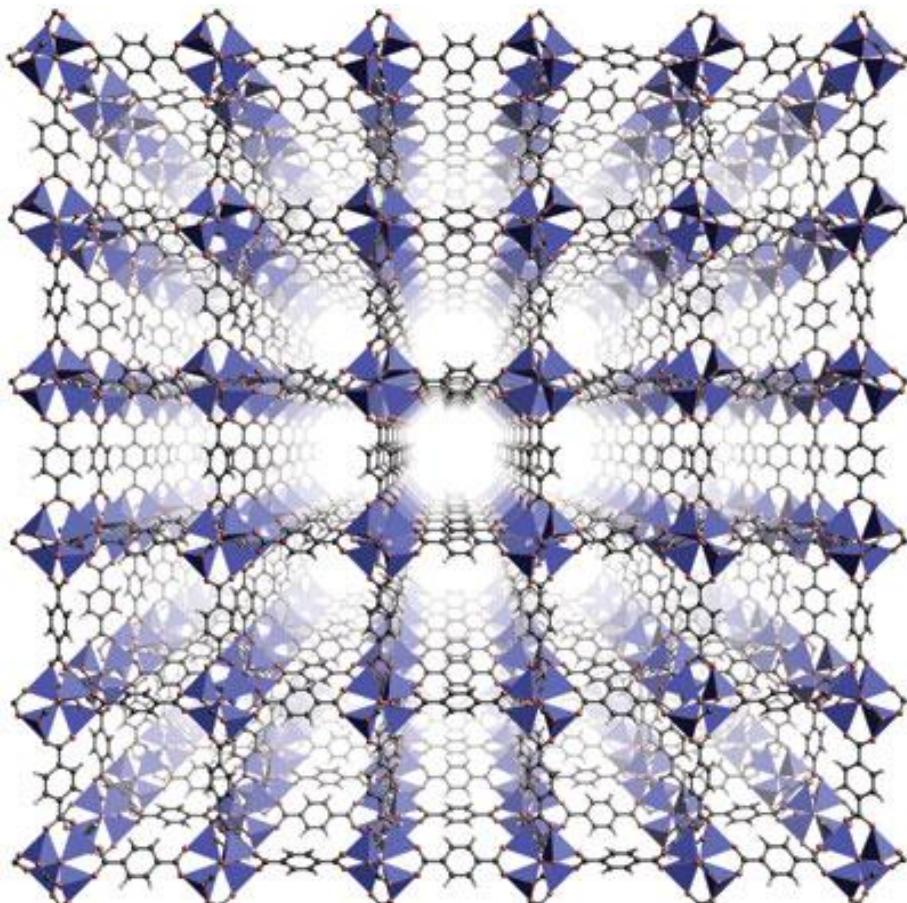


Metal-Organic Frameworks



$\text{Zn}_4\text{O(1,4-benzenedicarboxylate)}_3$
(MOF-5)

BET surface areas up to $5200 \text{ m}^2/\text{g}$

Density as low as 0.4 g/cm^3

Adjustable pore sizes of up to 5 nm

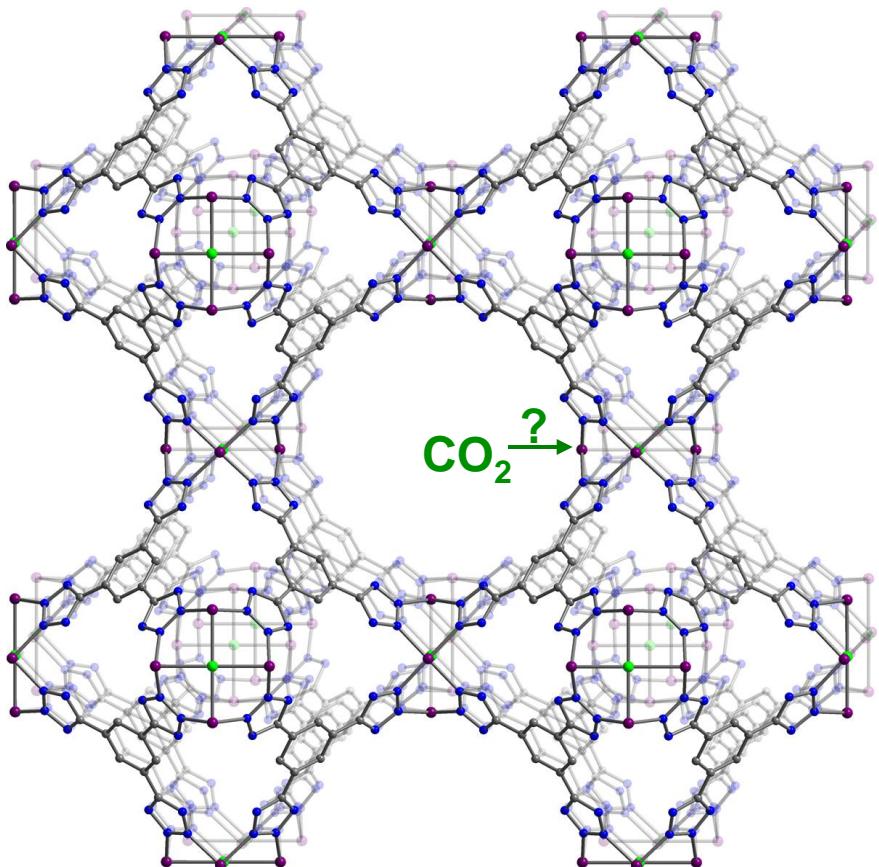
Channels connected in 1-, 2-, or 3-D

Internal surface can be functionalized

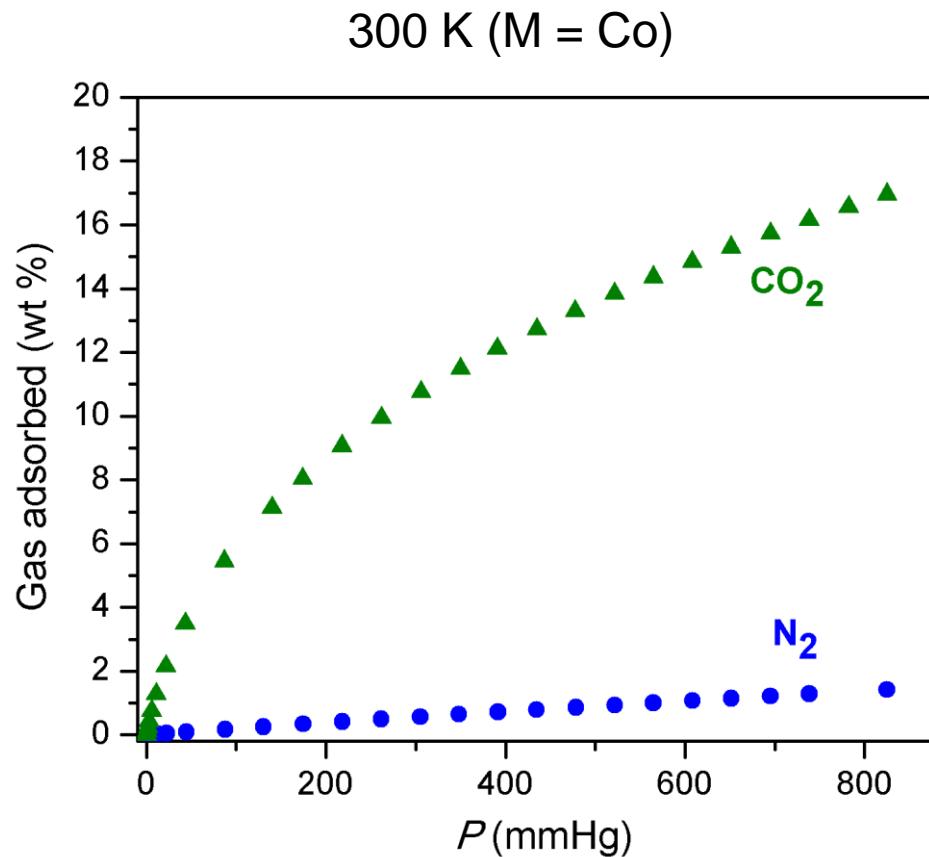
Can these porous, high-surface area materials be used for CO_2 capture?

Yaghi et al. *Nature* 2003, 423, 705

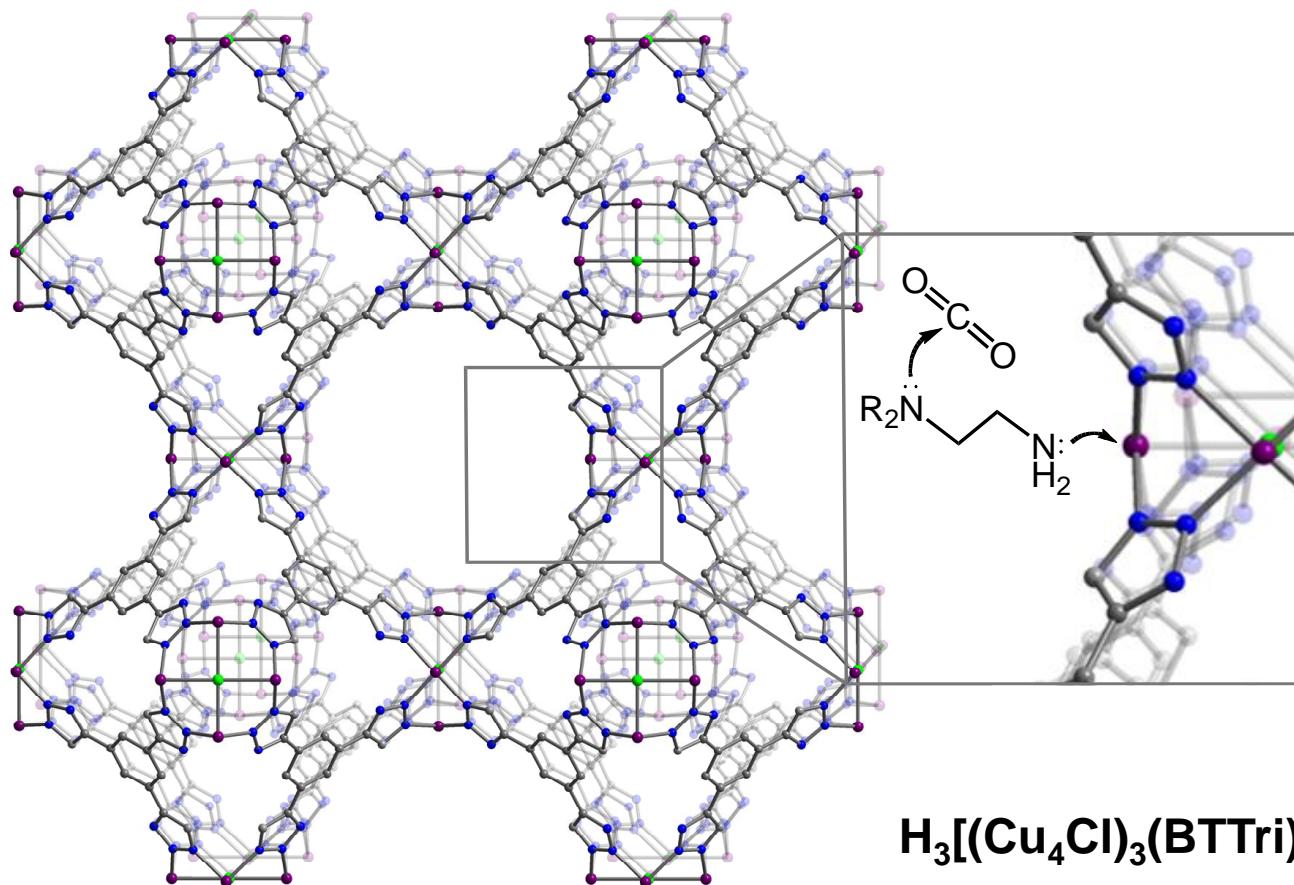
MOFs with Exposed Metal Coordination Sites



$M_3[(M_4Cl)_3(BTT)_8]_2$
(M = Mg, Ca, Cr, Mn, Fe, Co, Ni, Cu, Cd)



Alkylamine-Functionalized MOF Surfaces



- Initial isosteric heat of CO_2 adsorption of -90 kJ/mol observed
- Methods for directly functionalizing bridging ligands are under development